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ABSTRACT

A variety of techniques for improving readers' analysis-by-synthesis abilities (rapid, efficient reading typical of highly skilled readers) are presented in this paper. The techniques discussed in the first part emphasize improving reading comprehension and include the following: (1) modifications of the cloze procedure (encouraging readers to use the words around a slot to give clues as to what word might fit into it); (2) sentence combining (having students merge two or more kernel sentences into one, more complex sentence); (3) sentence manipulation (having students unscramble sentences); (4) guided composition (allowing students to see the redundancy of written language and how it offers clues as to meaning); (5) story structure (using fairy tale structure as a basis); and (6) "advance organizers" (relating new, more difficult material to students' existing knowledge--before they begin reading). The remainder of the paper contains suggestions for improving reading speed, including using repetitive syntactic patterns and practice paragraphs. (EL)

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ENHANCING READERS' ANALYSIS-BY-SYNTHESIS ABILITIES

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ENHANCING READERS' ANALYSIS-BY-SYNTHESIS ABILITIES

One model of reading which is based on theories in the interrelated fields of education, linguistics, psychology, and certain medical specialties is "analysis-by-synthesis." The analysis-by-synthesis model, which was originally developed to refer to a theory of speech perception (Wildman & Kling, 1978-1979), was extended to include a way of considering perception. Not surprisingly, the model was further extended to include the reading process of highly skilled readers.

Somehow, rapid readers proceed through text, not letter by letter, or even word by word, but by generating some sort of grammatical message internally (Kolers, 1972). They form a type of scenario and then use the printed page as a check on their prediction, so it is not necessary that they see every word, just a sufficient number to confirm or disconfirm their hypothesis (Norman, 1972). This sampling-predicting-confirming process has been referred to as "informed guessing" (Smith, 1979), but Eskey (1979, p. 69) feels that the process could better be described as "a kind of prediction based on very poorly understood rapid-fire sampling techniques of some kind."

So, when skilled readers draw on their knowledge of syntax, semantics, phonotactices, and experience, they are

able to move swiftly through the text. Stevens and Rumelhart (1975) state that

> By using his knowledge of the textual material--the conceptual contents, the semantic interpretation, and the syntactic constraints--the skilled reader effectively limits the number of possible alternatives that need to be considered at each point in the text. The act of reading becomes, in part, the act of confirmation--confirming that a word from the set of those predicted is in fact present (p. 137).

This process is much more rapid than reading word-by-word. Thus, the theory of analysis-by-synthesis as a strategy for rapid, efficient reading would appear to be difficult to reject. With this in mind, the following section proposes a variety of techniques for improving the analysis-by-synthesis abilities of readers. Most are adaptable for various ages, reading levels, and ethnicities of students. They are given in no particular order, in terms of most effective, or the order in which they should be presented to students. Some are supported by years of research, others are new or new renditions of the old.

CLOZE

Various modifications of the cloze procedure can be used successfully with nearly all ages. Although the "pure"

cloze procedure is used as a testing instrument--by taking a written passage and omitting every nth word--it can also be used to increase readers' predictive abilities by encouraging them to use the words around a slot to give clues as to what word would "fit" in the slot. An alternative to omitting every nth word in a passage is to delete only nouns, or verbs, or particular functors, depending on the purpose of the exercise and the level of the students.

> The rationale for using cloze as an instructional activity is that students become sensitive to the semantic and syntactic cues in text and learn to "test" the sensibility of the text produced from their word substitutions (Jenkins & Pany, 1981, p. 178).

Instead of always having students work alone on cloze activities, teachers should have students work together so that two or more students collaborate to "solve" the blanks. As they complete the task, students gain much from having to verbalize and/or defend their reasons for inserting particular words in particular slots. Poorer students gain both from having to articulate their reasons and from listening to better students articulate theirs.

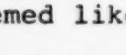
In both the group and individual cloze activities described above, no <u>one</u> right answer is demanded for each blank. As long as the completed text makes sense, students have successfully dealt with the task. Passages to use for cloze activities are easily developed and can be tailored to meet individual

student's interests and reading levels, by using graded basals and books which appeal to youngsters.

Another modification of the cloze procedure requires students to use the redundant features to the right of their fixation point (such as word length) to aid them in solving the slot. This modification is based on Hochberg's statement that when a reader processes rapidly, s/he is

> using letter strings for all they are worth, and he can only do it with material that is heavily redundant to him: i.e. this rate should be possible only with strings that are three or so words long, strings that he is able to recognize when he is given one clear word, plus the initial letter and word shape of another word, plus the word length of the last word (1976, p. 408).

In order to show children that reading in this way is possible, and to encourage them to "use letter strings for all they are worth," teachers could construct exercises using the configuration Hochberg mentioned. For example, after coming in from recess, the teacher could write on the board

> Today I saw lots of children playing ball. It seemed like they were h  ____.

After conducting this type of activity with students, they could be encouraged to construct their own. A student's idea could be put on large paper for the class to complete

or done with another classmate as a partner.

Using the cloze procedure, in its "pure" form and with the modifications suggested, is useful in fostering hypothesis-generating for analysis-by-synthesis. It is a strategy which enhances the abilities of able and remedial readers.

SENTENCE COMBINING

The second technique which can be used with students to enhance their analysis-by-synthesis abilities is sentence combining. Mellon (1979) said that he did not "know of any component in our arsenal of literacy-teaching methods that is better supported empirically than sentence combining" (p. 35). Sentence combining involves having students merge two or more kernel sentences into one, more complex sentence.

Knowledge of syntax is a powerful aid in being able to form hypotheses about upcoming text. Sentence combining gives students a feeling of control over their sytax (Morenberg, 1981). Through the manipulation of sentences, students can gain confidence in their own syntactic resources and strategies (Mellon, 1979). Strong (1976) says that the task of the teacher is to help the students "exercise the output functions of their brain computers and thus explore the depths of their linguistic power" (p. 60).

Sentence combining activities can be conducted either orally or in writing. When done orally, sentence combining forces students to hold stretches of discourse in their heads. In order to be able to do this, students must chunk bits of

information (Ney, 1981; Strong, 1976). If a reader can build meaningful chunks by extracting the meaning from phrases and clauses, then the reader will be able to hold a number of chunks in short term memory long enough to build the conceptual bridges among the chunks to allow reading comprehension to take place. This is far superior to the word-bound reader who exceeds his short term memory capacity somewhere between five and nine words (Miller, 1956). This type of reader will rarely be able to build a relationship among the items in a sentence--and without this comprehension, analysis-by-synthesis cannot take place. Sentence combining activities "provide the inexperienced reader with the opportunity to practice just those processes which will be most helpful in showing the reader how to cluster groups of words into phrases and clauses" (Sternglass, 1980, p. 326).

One type of sentence combining gives students a clue as to how the kernels should be combined. For example:

The boy ate an ice cream cone. (and)

The boy ate a hot dog.

This would result in, "The boy ate an ice cream cone and a hot dog." Another example of a signalled activity is:

Sandra fell asleep in class. (Because)

Sandra had stayed up all night.

This would result in "Because Sandra had stayed up all night, she fell asleep in class," or "Sandra fell asleep in class because she had stayed up all night."

The other type of sentence combining activity is unsignalled. For example:

Frank had a date.

The date was with Margie.

Margie was Frank's next door neighbor.

The resultant combination could be "Frank had a date with Margie, his next door neighbor," etc. Sentence combining is one way to help move students from focusing on individual words to focusing on larger semantic units.

SENTENCE MANIPULATION

Another activity which will increase readers' analysis-by-synthesis abilities involves having students unscramble sentences. Like cloze and sentence combining activities, sentence unscrambling can be done individually or in groups. After completing an exercise, it is beneficial to discuss why particular orderings do or do not work. For example, given

students home lunch for all the go

youngsters could say either "The students all go home for lunch" or "All the students go home for lunch." Both sentences could be considered correct. But, "The students for lunch all go home," would not be considered correct. Encouraging oral responses to such activities allows other members of the class to "fine tune" their "ear" for correct usage. Chunking of constituents is enhanced as students begin to see certain grammatical patterns repeat themselves (e.g. article adjective noun: the big dog).

GUIDED COMPOSITION

It would behoove teachers, in helping students develop the skill of analysis-by-synthesis, to point out to them the redundancy of language. One method that will allow students to see the redundancy of written language and how it offers clues as to meaning is called "guided composition" (Dykstra, Port, & Port, 1974). These exercises, which can be designed for first graders through college freshmen, allow students to experience the syntactic and semantic redundancy of the English language. The following is an example of a guided composition activity, written for second grade readers:

> The boy went to his grandmother's house. He ate pie while he was there.
>
> 1. Copy the sentences.
> 2. Change boy to boys. You must also change other words in the two sentences so that they both make sense.

The changed sentences can be reviewed in the class as a whole, or small groups can check themselves.

Whenever teachers do any kind of grammar work with their students, they should emphasize to the students how it can help them in their reading, especially the way it can help their predicting ability. Students should not be "left in the dark" when it comes to the reasons why they are learning certain skills. Young students rarely make the connection between the various subject and skill areas--they

view each one as discrete and having no relationship whatsoever to another. Making the connection will aid students in their learning and in their motivation for learning.

STORY STRUCTURE

Most of the reading that young people are asked to do involves interaction with stories. "Stories occur in virtually every culture...and therefore represent one of the most common forms of oral and written discourse" (Stein, 1983, p. 267). Although even very young children are able to discern a story from other types of prose, readers do not necessarily have the framework of the various types of stories as clearly differentiated. Therefore, direct teaching of these story structures is needed by readers (Pearson & Johnson, 1978).

For example, fairy tales have a regular pattern that they follow, and there are several motifs which the reader can always expect to find. So, over a period of several days, a teacher could read numerous fairy tales to his/her students and then ask them about the similarities they noticed. Depending on the age and sophistication of the students, these could be listed and/or illustrated. Then, more fairy tales could be read, reiterating the recurrent motifs. By giving readers the fairy tale story structure, they are afforded a ready framework on which to build their understanding of the next fairy tale they encounter. Their expectations are enhanced, which facilitates analysis-by-synthesis.

In a related vein, it is worthwhile to teach older students the way that English discourse tends to be organized so that they have a framework within which to read others' work (e.g. essays). In teaching international students, it is even more important to provide instruction in discourse structure and narrative form because all cultures do not organize their writing in the same manner (e.g. some are circular while others follow a linear progression). The teacher should always consider ways to adequately prepare students for the task that is expected of them.

ADVANCE ORGANIZERS

One method that some teachers use successfully to prepare students for an upcoming reading task is to use "advance organizers." Basically, according to Jenkins and Pany (1981, p. 168),

> an advance organizer consists of introductory material which is related to already existing ideas in the learner's head and which is written at a higher level of abstraction, generality, and inclusiveness than the learning passage itself.

This method appears to be more appropriate for intermediate to older students. The rationale for an advance organizer is that "it helps the reader to tap appropriate information in his or her head--information that will facilitate comprehension of the new data in the passage"(Pearson & Johnson, 1978, p. 18).

One strategy that teachers may use that is based on the same rationale as the advanced organizer, involves activating a reader's prior knowledge on a subject. Although a student may possess relevant prior knowledge, that alone is not enough to ensure comprehension (Danks & Pezdek, 1980). Some research indicates that the human lexicon may be stored in semantic fields so that when one word in the field is "called up," it excites the whole field. Meyer, Schvaneveldt, and Ruddy (1975) call this the "spreading excitation model." When a whole semantic field is excited, those words can be called up more quickly than words in unexcited fields.

Therefore, prior to reading a passage, it would aid students' comprehension (which will aid analysis-by-synthesis and vice versa) to do some type of exercise to excite or activate the semantic fields which will be particularly drawn upon in reading the text. Pearson and Johnson (1978) suggest using word association tasks. A teacher could also use pictures, real or vicarious experiences, discussion, vocabulary introduction, etc. to ensure that his/her students are not reading "cold."

The next group of suggestions for enhancing readers' analysis-by-synthesis abilities is more geared toward improving the speed at which the students can read. Mattingly (1972) said that "if only a reader can maintain the required minimum rate of input, many of his perceptual errors can be smoothed over in synthesis" (p. 145). The following strategies are intended to "speed up" the rate of input.

REPETITIVE SYNTACTIC CONSTRUCTIONS

One method for increasing the rate at which a reader reads is to use one syntactic construction over and over. Teachers may choose to use this strategy when teaching vocabulary or when reinforcing sight words. For example,

All the children ran out the door

All the dogs played in the pool.

All the boys skated around the rink.

All the girls danced through the garden.

All the babies crawled along the floor.

Wisher's (1976) research indicates that reading repetitive syntactic patterns allows more rapid reading with less effort expended to comprehend the whole sentence. This makes it ideal for use with poorer readers, in particular.

PRACTICE PARAGRAPHS

Dahl (reported in Jenkins and Pany, 1981) developed a method to enhance rapid reading for an experimental program for teaching high speed word recognition and comprehension skills. This method involves giving a student a paragraph to practice reading until it can be read in one minute or less. At that time, the student is given a new paragraph to practice. Teachers who want to use this technique can quickly compile an extensive file of paragraphs by using basals, magazines, trade books, students' writing, etc. It would seem advantageous to have paragraphs of

varying lengths and difficulties so that all the students could make gains from wherever their starting point.

Dahl's method is for use with students on an individual basis. It can be used with any age student and with nearly any reading level. A similar method, but one which can be used with a class-size group and is better suited for older readers of at least average ability, involves distributing a one page article or book excerpt to the students. The students are asked to read as rapidly as possible, looking only for the gist of the article. At the end of a brief time period (determined by the teacher), the students are to turn the paper over and are asked a series of general, gist-type questions. Results should not be expected at first, but will ensue frequent repetitions of this activity. Students should also be given tips about forcing their eyes to move more rapidly and to remember that every single word does not have to be looked at in order to get the general meaning of a passage.

To further demonstrate this concept to students, a teacher could modify a passage by deleting some of the functors, the lower half of words, or by varying type-size or ink color to highlight or diminish the prominence and significance of certain words. In addition, words, phrases, and/or sentences can be written on a transparency and then placed on an overhead projector which is turned on, and then off, rapidly. Students will be surprised at how much they

can read in a very short span of time. Such an activity excites and motivates them.

Children, young adults, and adults who are working to improve their skills in reading deserve to be motivated and excited about their progress. They deserve to be told as much as they can understand about how they read and about how particular exercises can affect their progress, and why. In order to be able to do this adequately, their teachers must be informed, motivated, and excited about their task as teacher. The concept of analysis-by-synthesis is intriguing, is very likely, and is worth teaching toward in order to improve the ability.

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